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The Spiral Nebula ♅ I. 153 *Ceti.* By W. S. Franks.

In revising the last working list at Starfield several objects were included that had previously been omitted on account of their great southern declination. The nebula ♅ I. 153 was one of these; so, taking advantage of an exceptionally clear sky on the evening of 1905 January 1 (when *Sirius* could be seen close to the horizon), I thought it was a favourable opportunity for attacking an object so long neglected. Although one of ♅'s Class I., it should, from its actinic effect, be relegated to Class II., for it is very faint on the original negative, and necessitated a repeated copy to bring it up to printing density (Plate 8).

Coming now to details, the object is N.G.C. 908, G.C. 536, ♅ I. 153, R.A. 2^{h} 18^{m} 28^{s}, Decl. −21° 41′·3 (1900). It is described in the N.G.C. as "considerably bright, very large, extended." The photograph was obtained on 1905 January 1, with 90^{m} exposure in the 20-inch reflector, between 2^{h} 7^{m} and 3^{h} 37^{m} local sidereal time; very clear and severe frost. The photograph at once shows it to be a rather interesting left-handed spiral, viewed somewhat obliquely. It is about 4′ long by about $1\frac{1}{2}'$ broad, and its major axis lies at about pos. ang. 80° ±. There is a central condensation, and a detached small star about 3′ *following* the nucleus; also a brighter star about 10′ *following*. A peculiar feature is the bifurcation of the *following* arm of spiral. I do not remember a parallel case in an object of this kind. The already long list of spiral nebulæ gains yet another accession by the inclusion of this object. The accompanying illustration will assist the foregoing description. The scale is approximately 12″ of arc to 1 millimetre.

Starfield Observatory, Crowborough Beacon.

Further Note on the Origin of Magnitude-Equation in Photographic Measures. By H. H. Turner, D.Sc., F.R.S., Savilian Professor.

1. In *Monthly Notices*, vol. lxv. p. 54, I drew attention to the fact that a faulty objective may produce images showing a magnitude-equation which has not hitherto, so far as I know, been considered; and further reflection and discussion have not altered my opinion that such a possibility must always be taken into account in discussing photographic measures for very small quantities, as in parallax work. But a recent conversation with the Astronomer-Royal suggests that the precise form of fault in the objective was probably not correctly assigned; and it may

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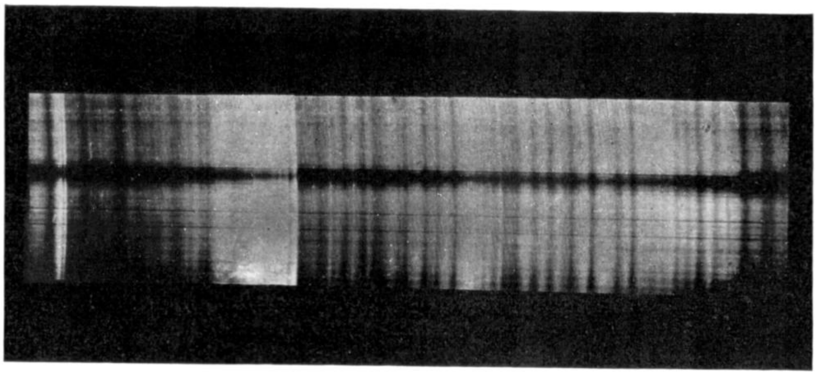
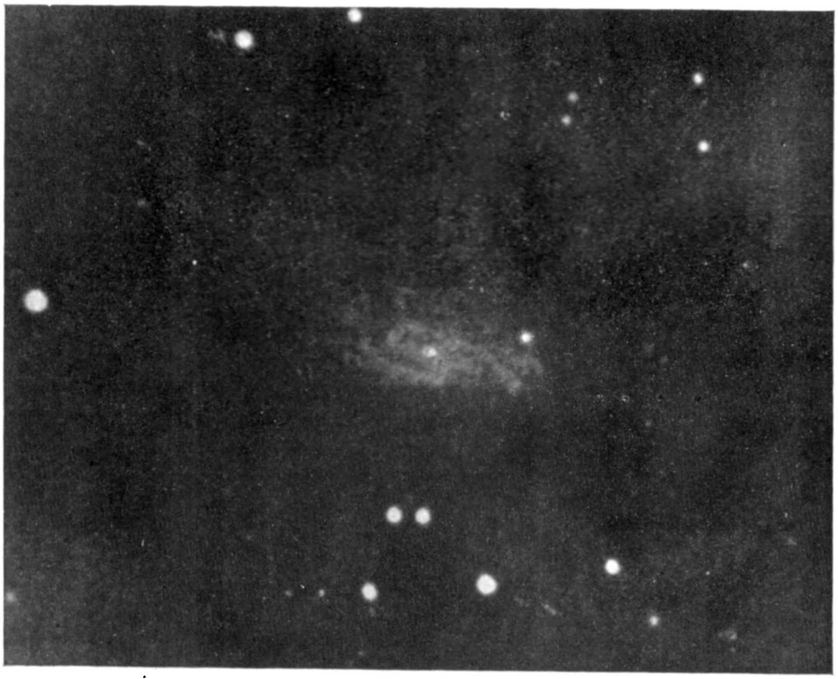
(Dr. W. E. WILSON'S Paper.)



SPECTRUM OF ARTIFICIAL SUN-SPOT.

(Mr. W. S. FRANKS' Paper.)



SPIRAL NEBULA H I.153 Ceti

Photographed by W. S. FRANKS.

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be useful to others to know beforehand what to look for if there is so conspicuous an effect as to suggest mechanical correction.

2. The remark of the Astronomer-Royal is briefly to the effect that an error of *centring* of one lens, *i.e.* a lateral displacement of one lens relatively to the other, is not so likely to produce serious effects as a relative *tilt*. This he found by personal experience when adjusting the 28-inch objective at the Royal Observatory. There was originally a defect which gave unsymmetrical out-of-focus images, and he in the first instance attributed it to defective centring as above, but found on trial that one lens could be moved laterally with reference to the other by quantities of the order of a quarter of an inch without serious change of the images. He then tried relative tilt, and found that a very small correction of that kind gave the required results. Hence it seems more likely that we should look for defects in this direction, especially if the lenses of an objective are sensibly separated.

3. The defect in the Algiers objective, which gave rise to the well-marked magnitude-equation, was apparently of this kind, though arising in rather a different way. I gather from M. Trépied that a representative from M. Gautier found the lenses of the objective pressed too tightly together. Such pressure would be very unlikely to be quite symmetrical, and the effect might be regarded as a form of tilt.

4. With heavy objectives it seems desirable to be on the watch for an error of this kind depending on the pressure produced by the weight of the objective itself. Such errors would, it is to be hoped, be very small; but they might come within the scope of very refined investigations; and they might unfortunately become serious from the enormous labour required to investigate them. They would, in each individual plate, be associated with "driving error," or correction-of-refraction error which might be of the same kind; and could only be determined from the mean of a large number of plates.

On the Possible Effects of Radiation on the Motion of Comets, with special reference to Encke's Comet. By H. C. Plummer, M.A.

1. It may be said with confidence that the theory of radiation, which occupies a prominent place in modern physics, possesses an importance in astronomy which is only beginning to be appreciated. It has been suggested that the repulsive force manifested in the tails of comets finds its simplest explanation in this theory, and quite recently Arrhenius has appealed to the properties of radiation in a discussion of the physical nature of the solar corona. To Professor Poynting we are indebted for a memoir on